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Rowland gives 180 lines of intensity 1 or higher, as due to iron. Both of these are from spectrograms having a scale of  $1\text{A}$  per millimeter.

The apparatus employed consists of a small 25,000 volt transformer with a mechanical rectifier to charge a glass plate condenser of 0.4 microfarad capacity. The condenser is discharged through a circuit consisting of a spark gap 2 cm. long, in series with which is a fine iron wire 5 cm. long and weighing about 2 mg. When the condenser discharges the wire explodes with a loud report and a brilliant flash of light, and if it is enclosed in a tube of wood having an internal diameter of 1 cm. or less, the continuous spectrum is observed on viewing the tube, end on. The average duration of the explosion is of the order of  $10^{-5}$  seconds, and ten explosions are sufficient to record a fully exposed spectrum of the  $\lambda 4000$  region, using a grating spectrograph giving a dispersion of  $6\text{A}$  per millimeter. An exposure to the sun in this region requires  $1/40$  second, from which it follows that this new source of light is of the order of 100 times as bright as the sun. With a quartz spectrograph the ultra-violet region at  $\lambda 2300$  (scale  $4\text{A}$  per millimeter) is well recorded with 10 explosions, and the region at  $\lambda 3500$  (scale  $20\text{A}$  per millimeter) with 1 or 2 explosions.

A few trial exposures have been made using nickel, copper, and manganin wires. These indicate that with nickel, the spectrum is considerably brighter than with iron, while with copper it is much weaker. Manganin and iron give about the same intensity.

With a larger condenser and higher voltage it is hoped that the brightness may be materially increased.

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#### REPORT OF THE AUTUMN MEETING

#### PREPARED BY THE HOME SECRETARY

The Autumn Meeting of the Academy was held at Yale University, New Haven, Ct., on November 10 and 11, 1919.

Fifty-six members were in attendance, as follows: Messrs. C. G. Abbot, Bailey, Benedict, Boltwood, Bumstead, Cannon, Cattell, Chittenden, Cross, Cushing, Dana, Davenport, Davis, Day, Donaldson, Elkin, Flexner, Gomberg, Gooch, E. H. Hall, Harrison, Hastings, Henderson, Howard, Jennings, Johnson, Kasner, Leuschner, Lusk, Lyman, Mayor, Meltzer, Mendel, C. E. Mendenhall, Millikan, E. S. Morse, E. F. Nichols, A. A. Noyes, H. F. Osborn, T. B. Osborne, Parker, Pearl, Prudden, Russell, Schuchert, Setchell, Squier, Stratton, A. Trowbridge, Verrill, Walcott, Webster, H. S. White, Edmund B. Wilson, Edwin B. Wilson, R. W. Wood.

#### BUSINESS SESSIONS

The President announced the deaths of W. G. Farlow, elected to membership in the Academy in 1879; Joseph Barrell, elected in 1919; Lord Ray-

leigh, elected foreign associate in 1898; and Emil Fischer, elected foreign associate in 1904.

The Home Secretary stated that a Section of Engineering had been established and that it is now constituted as follows: Messrs. H. L. Abbot, J. J. Carty, W. F. Durand, J. R. Freeman, H. M. Howe, F. B. Jewett, G. O. Squier, D. W. Taylor. All members of the Sections of Physics and Chemistry were given an opportunity to remain with the section with which they had been affiliated or to be placed in the Section of Engineering.

Messrs. L. O. Howard, C. E. Mendenhall, and David White were appointed to audit the accounts of the Treasurer.

Messrs. J. C. Merriam, Gano Dunn, L. J. Henderson, A. L. Day, and W. J. V. Osterhout were elected members, and Mr. Raymond Pearl was re-elected chairman, of the Editorial Board of the PROCEEDINGS, to serve for three years. Mr. E. B. Wilson was re-elected Managing Editor for one year.

The following cable, prepared by the Foreign Secretary at the request of the President and forwarded to *Nature*, was read:

"The President of the National Academy of Sciences requests me to offer his congratulations to *Nature* on the occasion of its jubilee. During a period of specialization *Nature's* extensive survey of the progress of research has stimulated wider vision and larger effort. In spite of repeated discouragement it has urged upon the statesmen of two generations the vital importance of science to the nation. At a time when the branches of science, no longer isolated, are uniting in common channels and when governments, once unappreciative, are recognizing the bearing of research on national security and public welfare, we rejoice in *Nature's* expanding influence and the higher opportunities opening to it in a newly ordered world."

The President reported that Mrs. Mary Clark Thompson had completed the establishment of a fund amounting to \$10,000, the income of which is to be applied to a gold medal of appropriate design, to be awarded annually by the Academy for the most important services to geology and palaeontology. The medal is to be known as the MARY CLARK THOMPSON GOLD MEDAL. Mrs. Thompson previously gave an additional \$1,000 for the preliminary expenses of dies, etc. The following recommendation, in acknowledgment of this gift, was adopted:

"That the National Academy of Sciences express to Mrs. Mary Clark Thompson the appreciation of its members, especially those working in the fields of geology and palaeontology, for this munificent gift to promote the recognition of research in these subjects."

In accordance with the recommendations of the Henry Draper Committee, the following grants and award of medals were approved:

1. \$400 to Dr. S. A. MITCHELL, Director of the Leander McCormick Observatory, University of Virginia, to complete the purchase of a measuring microscope for use in the photographic determination of stellar paral-

laxes, on the basis of observations made with the 27-inch refracting telescope. The Academy awarded the sum of \$250 from the Draper Fund to Dr. Mitchell in 1916 to apply on the purchase of this instrument. The microscope cost \$650. The proposed grant of \$400 will complete the purchase, in effect making the instrument the property of the Academy, and Professor Mitchell will devote an equivalent sum, \$400, to the other needs of his parallax research.

2. \$300 to Dr. JOEL STEBBINS, Professor of Astronomy in the University of Illinois, to assist in the further development and application of the photo-electric cell photometer.

3. \$400 to Dr. FRANK SCHLESINGER, Director of the Allegheny Observatory, to enable him to test an automatic zenith camera for the determination of terrestrial latitudes with the expectation that the results will be more accurate than any hitherto obtained by other means. It is proposed that this instrument be mounted at least temporarily at the International Latitude Observatory, Ukiah, California, where the astronomer in charge, Mr. Neubauer, will operate it for a year or two as a labor of love. The grant is needed to install the instrument at Ukiah and to make certain auxiliary apparatus required in its operation.

The award of the HENRY DRAPER GOLD MEDAL to ALFRED FOWLER, F.R.S., Professor of Astrophysics, Imperial College, South Kensington, London, at the time of the stated meeting in April 1920, for his researches in celestial and laboratory spectroscopy, which have led to a valuable increase of our knowledge of sunspots, comets, and the stars—especially red stars of Secchi's Type III.

At the dinner held at the Hotel Taft on November 11, the DANIEL GIRAUD ELLIOT MEDAL AND HONORARIUM was presented to Mr. C. WILLIAM BEEBE, of the American Museum of Natural History, New York, for his work, *Monograph of the Pheasants*. Dr. Osborn, Chairman of the Committee on the Award of the Elliot Medal, outlined briefly the history of this award, and Mr. Beebe responded, giving a short, interesting talk about his researches on pheasants. Immediately following the dinner, President Walcott presented the following recommendations from the Council, which were unanimously adopted:

"That the medal for eminence in the application of science to the public welfare be awarded at the Annual Meeting in April 1920, to HERBERT C. HOOVER for his applications of science in the conservation, selection and distribution of food."

"That the Home Secretary be requested to transmit the thanks of the Academy to Yale University, President Hadley, the Board of Governors of the Graduates' Club, and to the members of the Academy forming the local committee, for the courtesies extended to the members of the National Academy of Sciences during the Autumn Meeting of 1919."

#### SCIENTIFIC SESSIONS

The following papers were presented at the scientific sessions, November 10 and 11. One asterisk denotes presentation by invitation; two asterisks, presentation only by title; a dagger denotes that the article has been offered for publication in the PROCEEDINGS.

- W. M. DAVIS: Four cliff islands in the coral seas.
- EDWARD KASNER: Some new theorems in the dynamics of a particle.
- \*HENRY LAURENS and HENRY D. HOOKER: The relative physiological efficiency of spectral lights of equal radiant energy content.
- \*RICHARD S. LULL: A study in synthetic paleontology.  
\*\*Biographical memoir of Samuel Wendell Williston.
- \*YANDELL HENDERSON: The adjustment to the barometer of the haemato-respiratory functions in man.†
- \*GEORGE A. BAITSSELL: Development of connective tissue in the amphibian embryo.†
- C. G. ABBOT: A new method for determining the solar constant of radiation.†
- \*LEIGH PAGE: A kinematic interpretation of electromagnetism.†
- C. B. DAVENPORT and ALBERT G. LOVE: Defects found in drafted men.
- \*JAMES B. MURPHY: The effect of physical agents on the resistance of mice to cancer.†
- JOHN M. CLARKE: Some restorations of extinct vertebrates.  
The great sponge colonies of the Devonian: their origin, rise, and disappearance.
- \*HENRY G. BARBOUR and J. B. HERRMANN: On the mechanism of fever reduction by drugs.†
- EDWIN H. HALL: The Thompson effect from the point of view of dual electric conductivity.
- \*ALOIS F. KOVARIK: A statistical method for studying the radiations from radioactive substances and the X-rays.
- \*M. C. WINTERNITZ: Anatomical changes in the respiratory tract associated with acid insufflation.
- \*FRANCIS G. BLAKE: Experimental pneumonia in monkeys.
- R. A. MILLIKAN: The effect upon an atom of the passage of an alpha ray through it.  
The extension of an ultra-violet ray spectrum.
- \*HIDEYO NOGUCHI: Leptospira icteroides and yellow fever.
- \*H. H. LAUGHLIN: Calculating ancestral influences in man.
- \*FRANK P. UNDERHILL, JAMES A. HONEIJ and L. JEAN BOGERT: Calcium and magnesium metabolism in certain diseases.†
- HENRY FAIRFIELD OSBORN and CHARLES CRAIG MOOK: Reconstruction of the skeleton of the sauropod dinosaur Camarasaurus Cope (Morosaurus Marsh).†
- WILLIAM K. GREGORY (communicated by H. F. Osborn): Restoration of camarasaurus and life model.†
- WILLIAM DILLER MATTHEW (communicated by H. F. Osborn): Plato's Atlantis in paleography.†
- SIMON FLEXNER: Lethargic encephalitis and poliomyelitis.†
- A. G. MAYOR: The history of the coral reefs of Tutuila, Samoa.  
\*\*Biographical notice of Samuel Hubbard Scudder.
- \*R. A. DALY: Changes of land and ocean levels.
- \*SAMUEL RANDALL DETWILER: On hyperplasia of nerve centers resulting from excessive peripheral loading.†
- T. B. OSBORNE: Concentration of the water-soluble vitamine or yeast.
- \*G. P. CLINTON: The manner of infection of white pine by the blister rust.
- T. B. OSBORNE and LAFAYETTE B. MENDEL: Certain chemical properties of foods and their relation to nutrition.  
\*\*F. LOHNIS (introduced by Raymond Pearl): Studies upon the life cycles of bacteria.
- \*\*E. W. NELSON (introduced by C. D. Walcott): Lower California and its natural resources.
- \*\*F. W. CLARKE: A recalculation of the atomic weights.
- \*\*EDWIN R. A. SELIGMAN: Biographical memoir of Richmond Mayo-Smith.

- \*\*THOMAS C. CHAMBERLAIN: Biographical memoir of Charles R. Van Hise.  
RAYMOND PEARL: On the embryological basis of human mortality.†  
\*E. W. BROWN: Jupiter's five attendant planets.  
\*C. C. LITTLE: Notes on human sex ratio.  
\*A. M. BANTA: Sex intergrades and their peculiar inheritance.  
\*J. K. WHITTEMORE: The starting of a ship under constant power.  
\*LORANDE LOSS WOODRUFF: Endomixis in relation to selection in paramecia.  
A. A. NOYES and DUNCAN MACINNES: The activity of ions in largely ionized substances.†  
F. G. BENEDICT: The basal metabolism of boys from one to thirteen years of age.†  
\*\*EDWARD S. MORSE: Biographical memoir of Charles S. Minot.  
EDWIN B. WILSON: Radiationless orbits.†  
\*DAVID L. WEBSTER: The intensities of X-rays of the L series, II. The critical potentials of the platinum lines.†
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